



Twitter: @agomezodd

User R Conference 2019, visit: www.conectar2019.ucr.ac.cr
@ConectarR2019



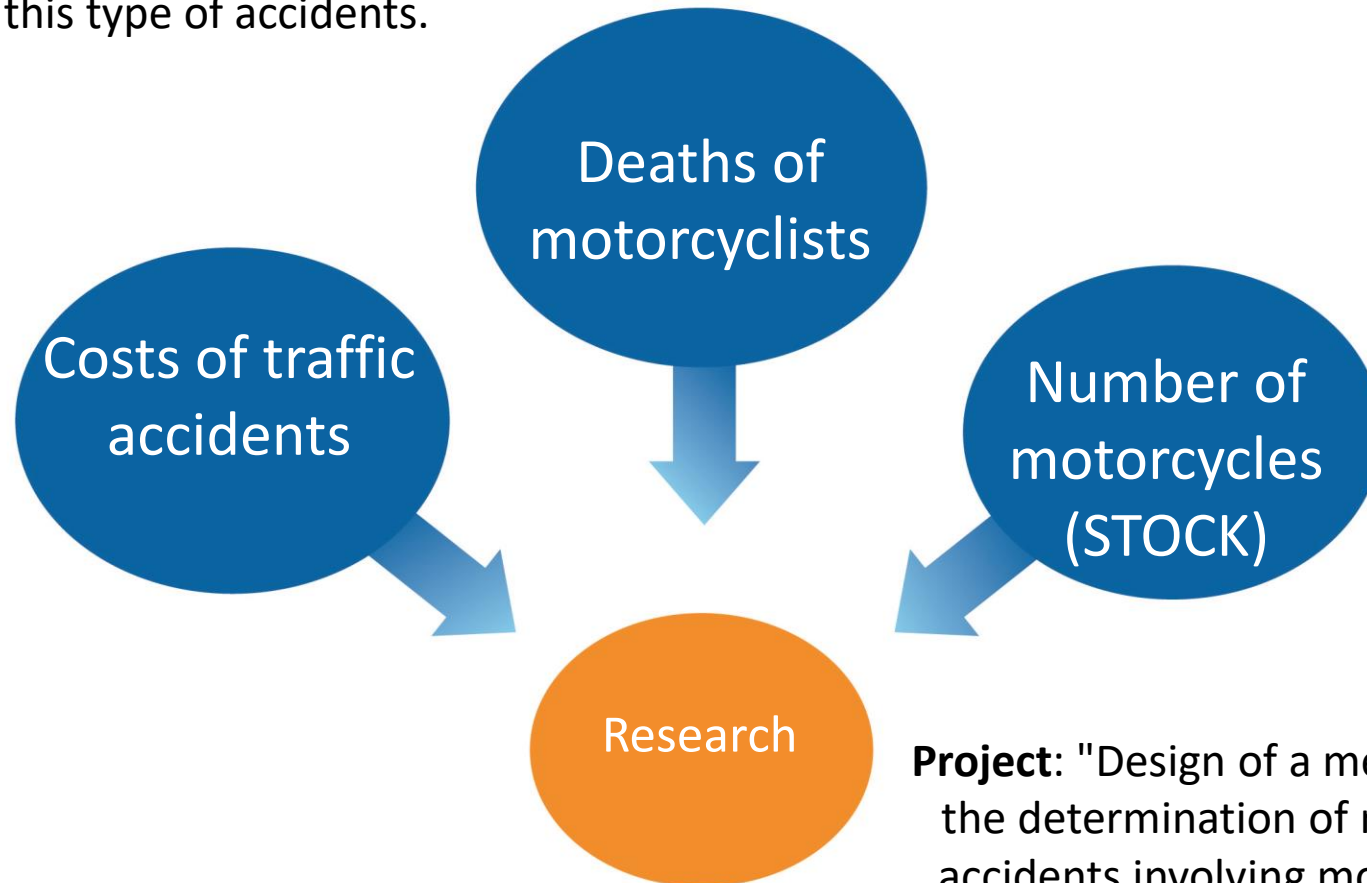
Estimation of Potential Years of Life Lost and Disability-Adjusted Life Year due to traffic accidents involving motorcycles in Costa Rica

MOTIVATION:

Analyze the costs of traffic accidents in Costa Rica during the period 2000-2016 in which motorcycles are involved, with the purpose that this information will allow the political organisms in charge of road safety to support the decision-making on future strategies on the legislation and impact of this type of accidents.

FACT: Motorcyclists are part of 23% of deaths in traffic accidents around the world. (WHO, 2015)

Fact about Costa Rica
Road crashes increased by 3.6% of the Gross Domestic Product (GDP) in 2012 (Probus, 2012).



Fact about Costa Rica
Between 2006 and 2007 the fleet of motorcycles increased by more than 31%. (COSEVI, 2015)

Project: "Design of a methodology for the determination of risk factors in accidents involving motorcyclists in Costa Rica" (Project 748-B6-347)

Methodology

Potential Years of Life Lost (PYLL)

- 2000-2017
- PYLL = Mortality rate

Σ [(number of deaths in each age group) x (end point age – midpoint of each age group)]

It illustrates the loss suffered by society as a result of the death of young people or premature deaths.

Disability-Adjusted Life Year (DALY)

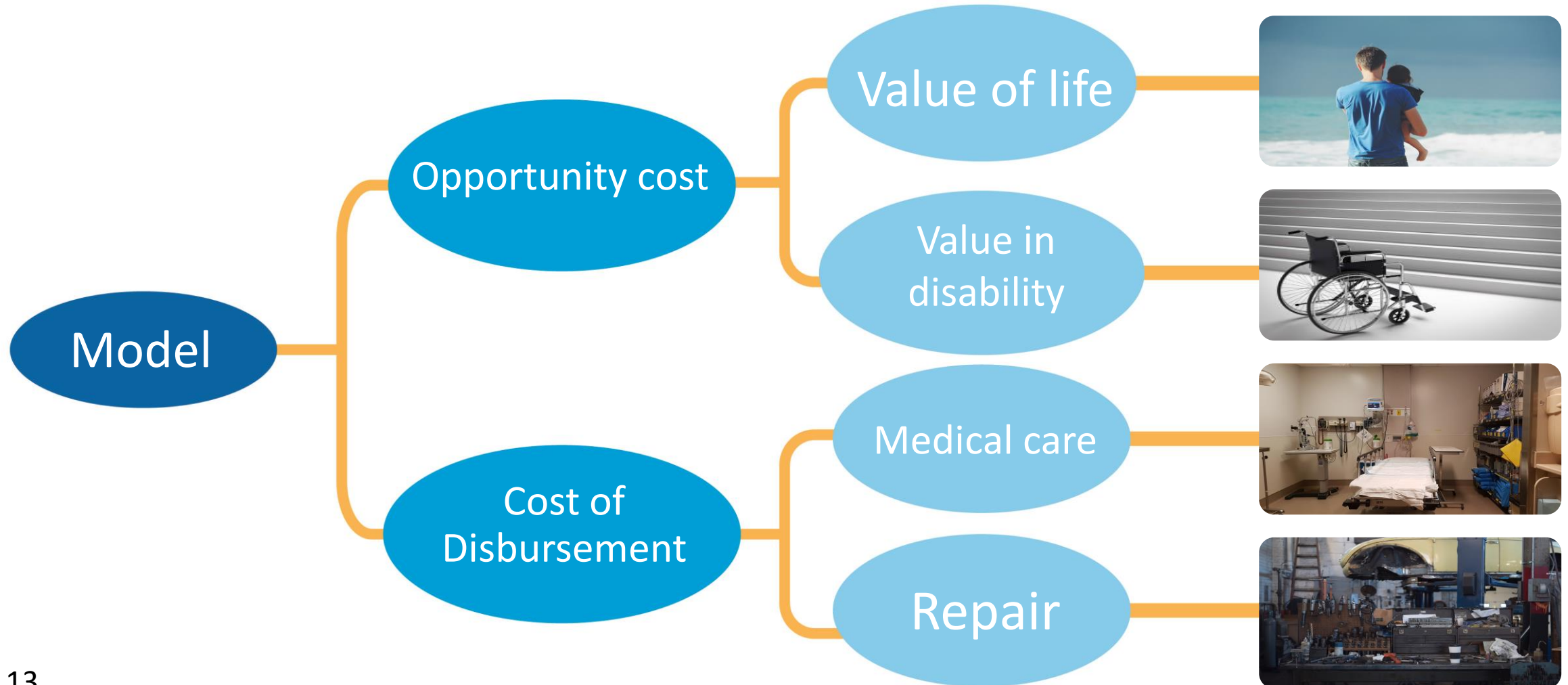
- 2012-2015
- PYLL + Disability

It measures the effect of the accident during the time of the disability and reflects the amount of the person's non-recoverable healthy life time.

$$\text{DALY} = \text{YLL} + \text{YLD}$$

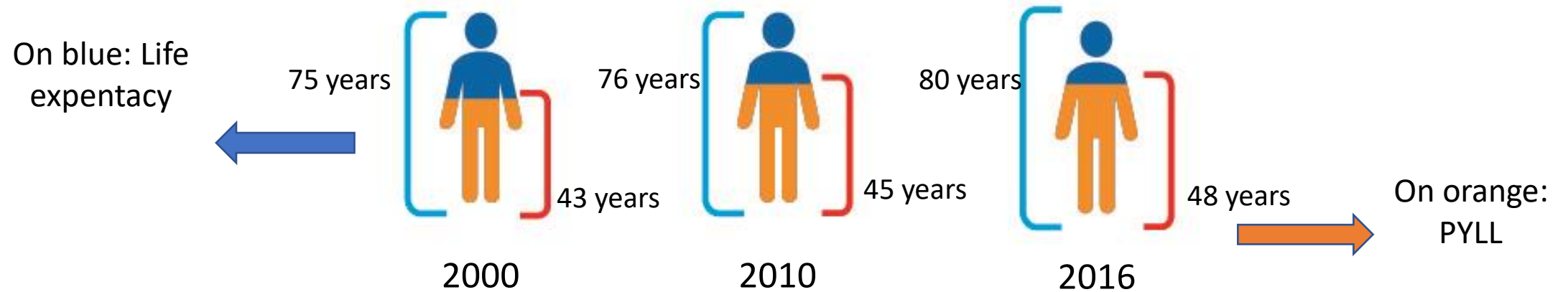
Methodology

Evaluation Model



Average Potential Years of Life Lost (PYLL) due to motorcycle accident

Costa Rica 2000- 2016

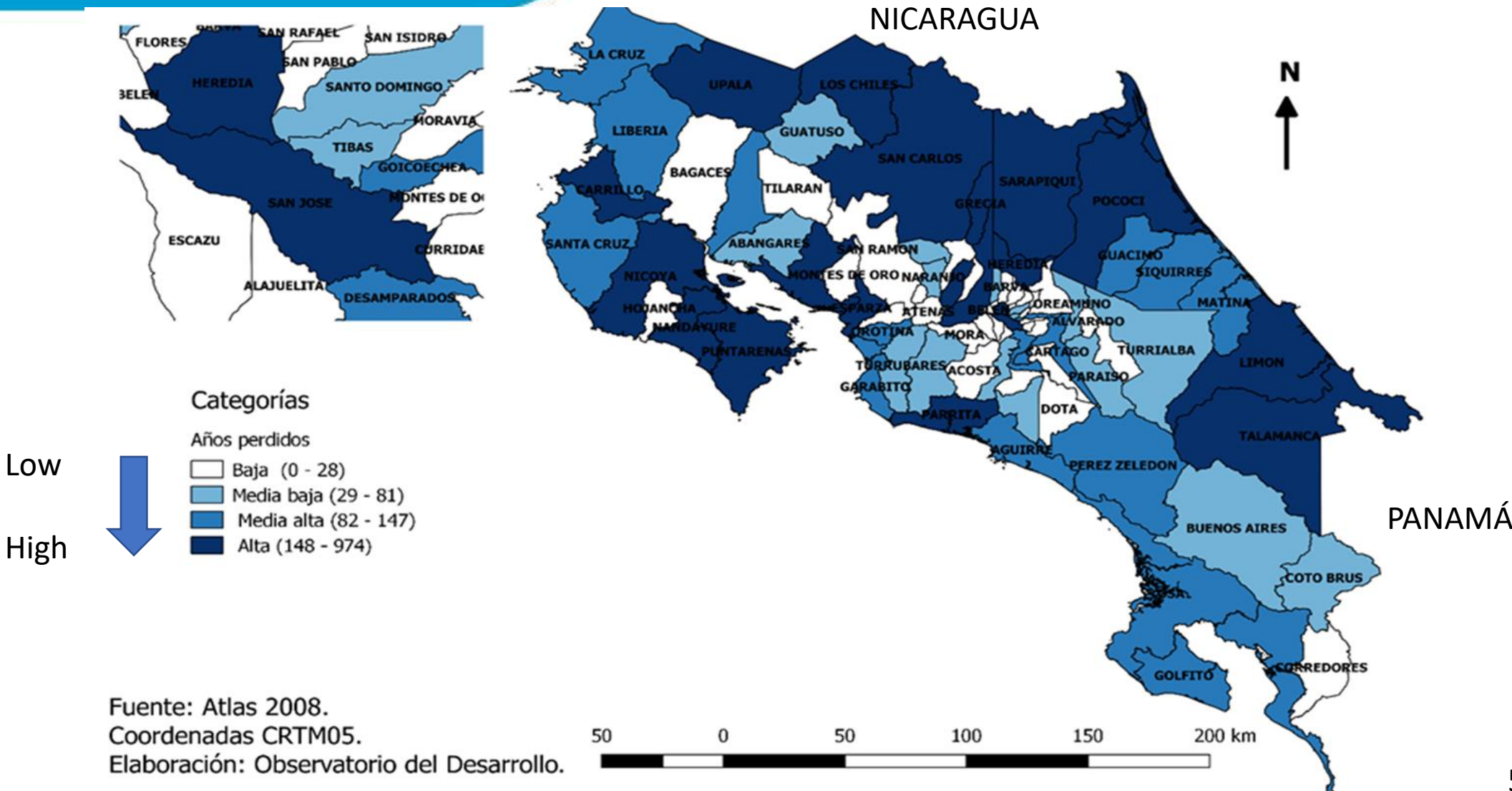


Life expectancy has increased during the period from 2000 to 2016 in 5 years

However, in only 7 years, the potentially lost years of life increased in 4 years

Potential Years of Life Lost (PYLL) due to traffic accidents involving a motorcyclist or motorcycle passenger per canton

Costa Rica 2016



Summary

DALY

Disability-Adjusted Life Year (DALY)
due to traffic accidents where a
motorcyclist is involved in Costa Rica during
the years 2012 to 2015



Year	PYLL	Disability	DALY
Total	36,532	110,377	146,909
2012	9,627	22,505	32,132
2013	8,181	27,584	35,765
2014	11,441	29,276	40,717
2015	7,283	31,012	38,296

Note: 26349 injured in motorcycle accidents and 785 confirms deaths

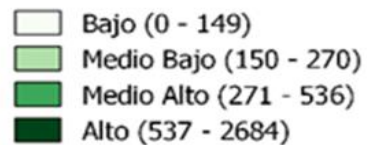
Disability-Adjusted Life Year (DALY) due to traffic accidents involving one motorcyclist or motorcycle passenger per canton

Costa Rica 2015



Categorías

Años perdidos

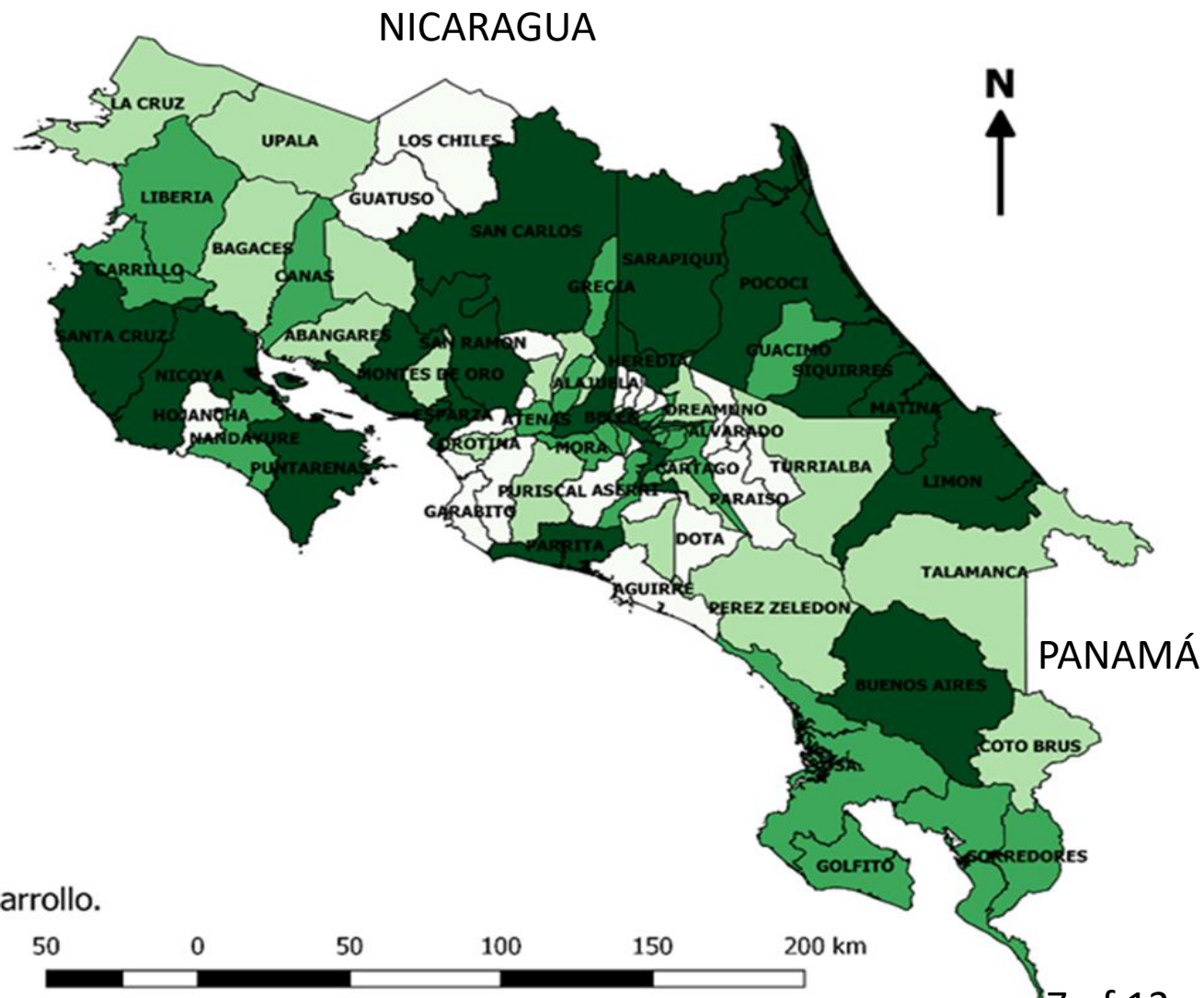


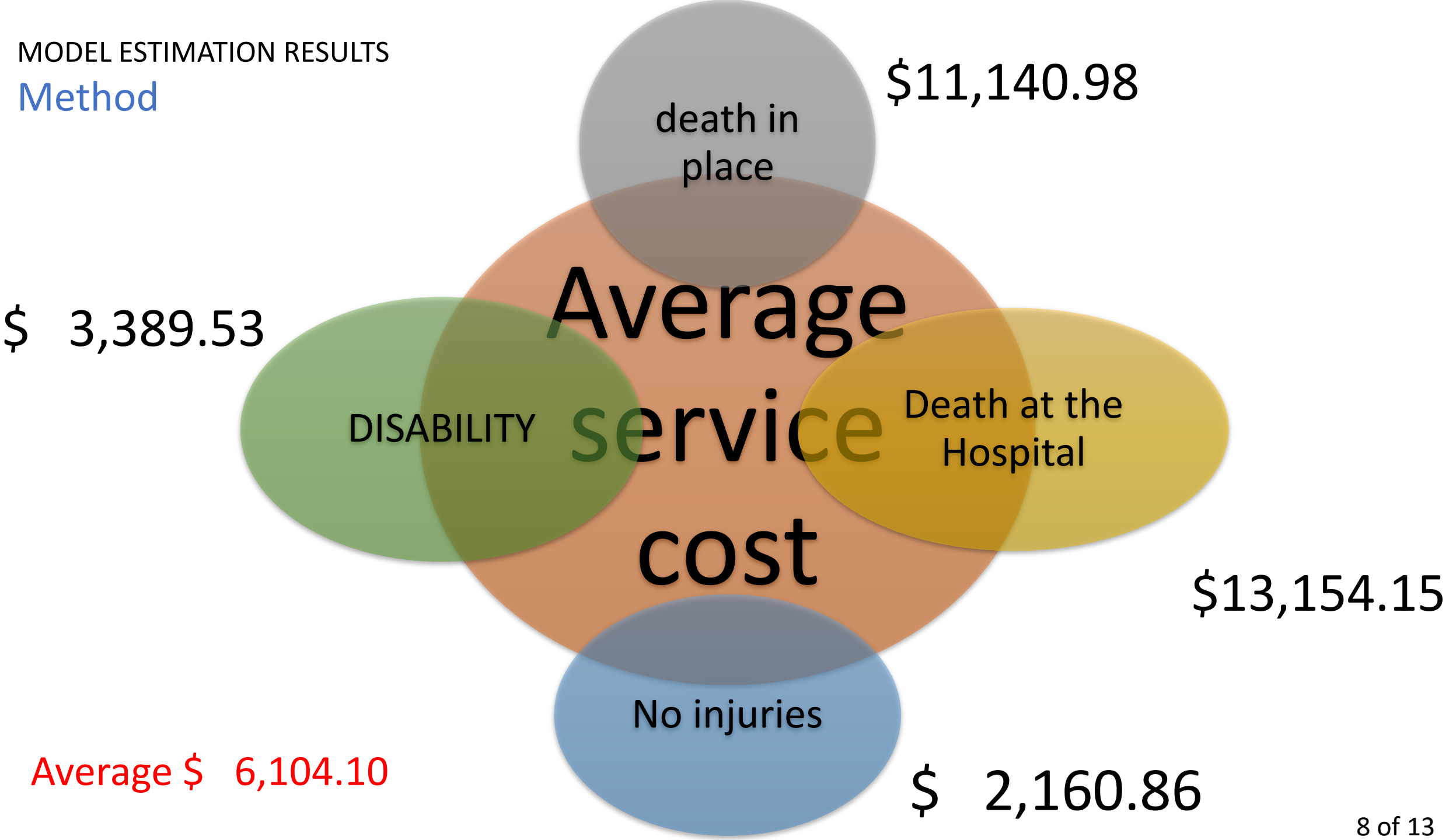
Low



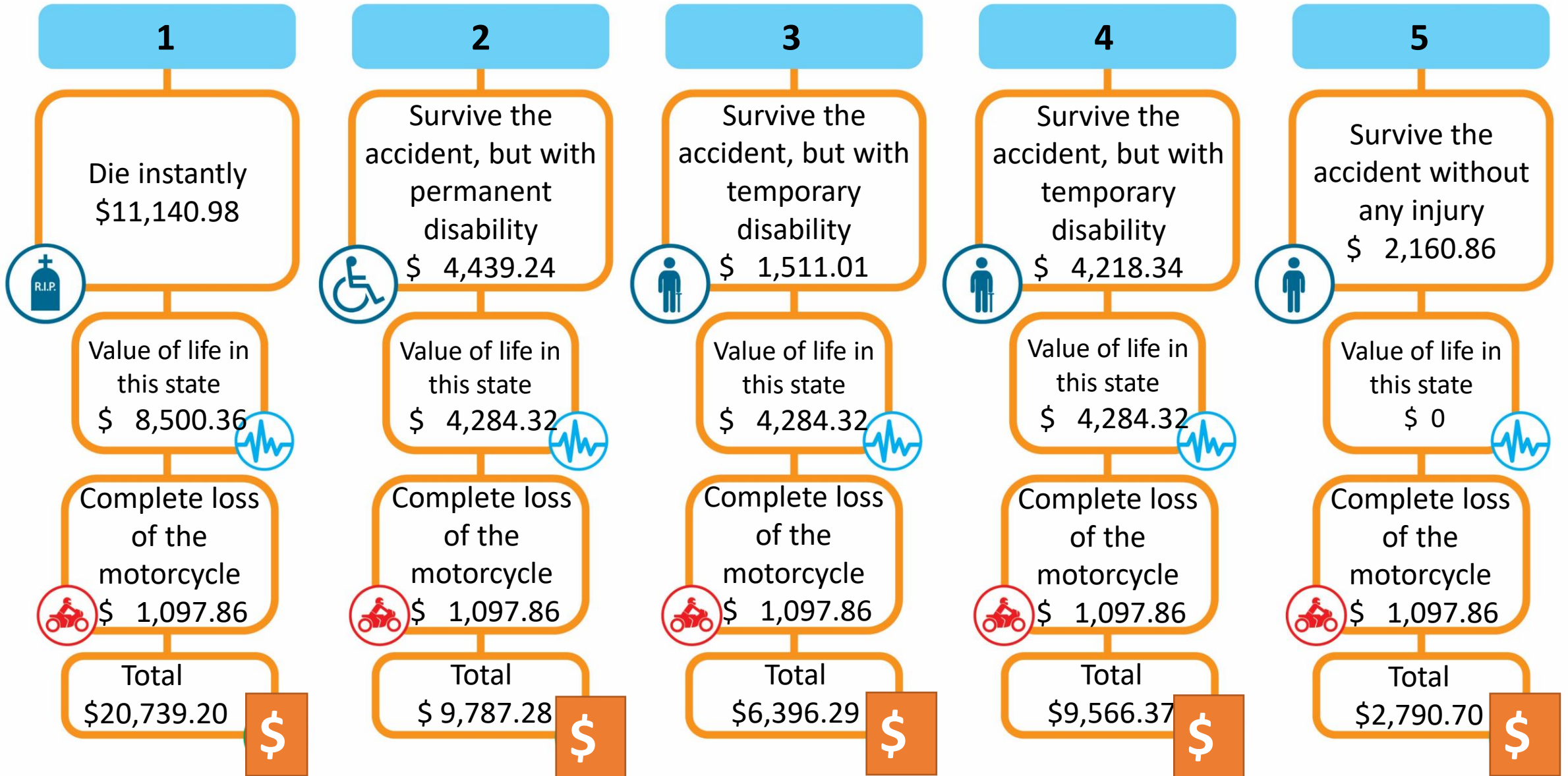
High

Fuente: Atlas 2008.
Coordenadas CRTM05.
Elaboración: Observatorio del Desarrollo.





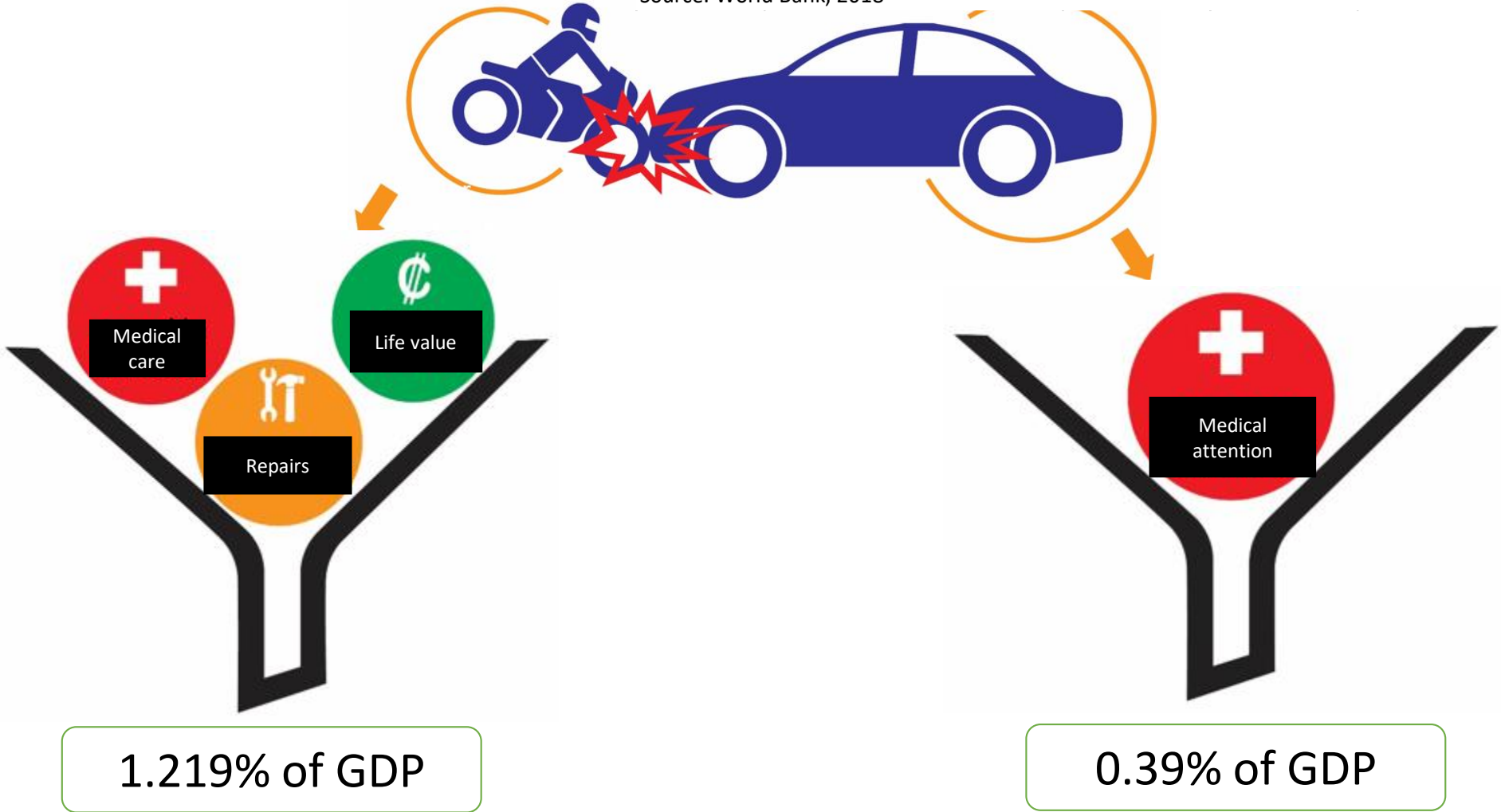
Scenarios



Estimated costs of traffic accidents where a motorcycle is involved for the country

Rank	Country GDP	Last	Previous	Highest	Lowest	
1	United States	\$ 18,624.48	\$ 18,121.00	\$ 18,624.00	\$ 543.00	USD Billion
2	European Union	\$ 16,397.98	\$ 16,335.00	\$ 19,118.00	\$ 359.00	USD Billion
3	Euro Area	\$ 11,885.66	\$ 11,616.00	\$ 14,115.00	\$ 245.00	USD Billion
80	Costa Rica	\$ 57.44	\$ 54.84	\$ 57.44	\$ 0.48	USD Billion
202	Kiribati	\$ 0.17	\$ 0.16	\$ 0.19	\$ 0.01	USD Billion
16-Dec						

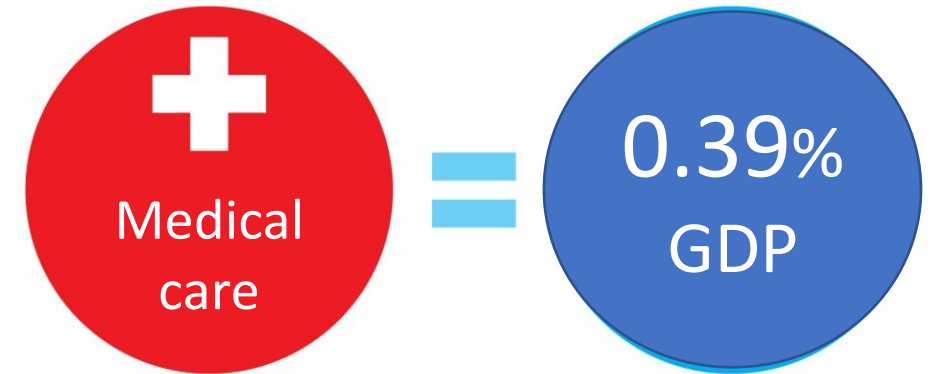
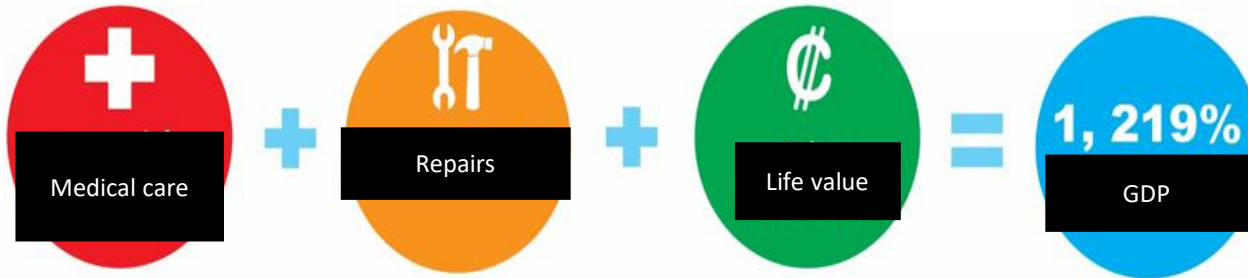
Source: World Bank, 2018



Comparison model:

The ratio of the cost of traffic accidents with the budget to the ministries according to the percentage of expenditure with GDP

Costa Rica 2016



Ministry of Transportation

1.29%

Treasury

0.02%

Ministry of Health

1.02%

Ministry of Environment
and Energy

0.41%

Result's

- PLYY
 - More years are lost between the ages of 20-29 years.
 - On average, we lost more PLYY in accidents than gain life expectancy.
 - Men's lose more years than women's.
- DALY
 - Costa Rica lose almost three times more Disability-Adjusted Life Year than PLYY.
 - The cantons of the northern area of Costa Rica are the places where most years are lost due to Disability.
- GDP.
 - The cost of medical care for motorcycle traffic accidents represent the 0.39% of the GDP on 2016
 - In addition, if other aspects are taken into account, the cost of motorcycle traffic accidents is 1.2% of 2016 GDP.